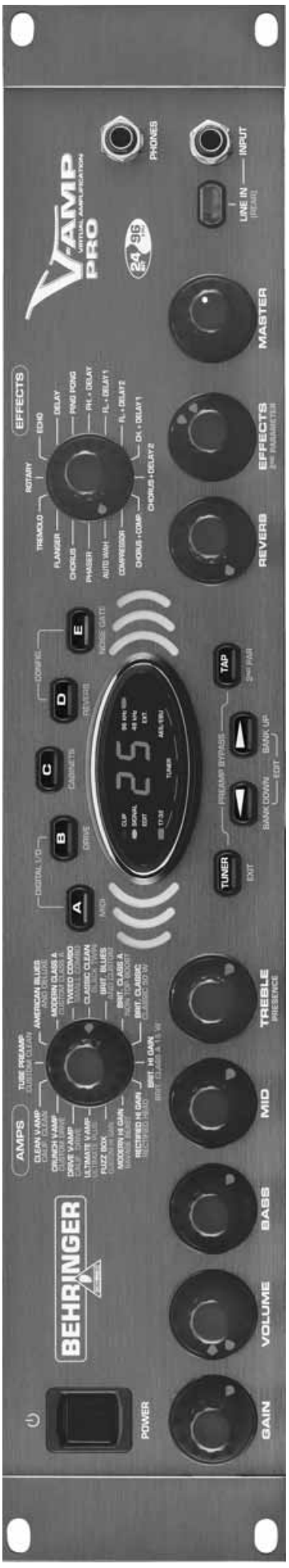
V-AMP PRO



ENGLISH

User's Manual

Version 1.0 September 2002

BEHRINGER

INSTRUMENT AMPLIFICATION

SAFETY INSTRUCTIONS

CAUTION: To reduce the risk of electric shock, do not remove the top cover (or the rear section). No user serviceable parts inside; refer servicing to qualified personnel.

WARNING: To reduce the risk of fire or electric shock, do not expose this appliance to rain and moisture.

This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure—voltage that may be sufficient to constitute a risk of shock.

This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

DETAILED SAFETY INSTRUCTIONS:

All the safety and operation instructions should be read before the appliance is operated.

Retain Instructions:
The safety and operating instructions should be retained for future reference.

Heed Warnings:
All warnings on the appliance and in the operating instructions should be adhered to.

Follow instructions:

All operation and user instructions should be followed.

Water and Moisture:
The appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, near a swimming pool etc.).

Ventilation:
The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be placed on a bed, sofa, rug, or similar surface that may block the ventilation openings, or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

Heat:
The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

Power Source:
The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

Grounding or Polarization:

This device must be grounded.

Power-Cord Protection:
Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, extension cords and the point where they exit from the appliance.

Cleaning:
The appliance should be cleaned only as recommended by the manufacturer.

Non-use Periods:
The power cord of the appliance should be unplugged from the outlet when left unused for extended periods of time.

Debris and Liquid Entry:
Care should be taken that debris and/or liquids do not enter the enclosure through openings.

Damage Requiring Service:
The appliance should be serviced by qualified service personnel when:

- The power supply cord or the plug has been damaged; or
- Debris or liquid has entered the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a noticable change in performance; or
- The appliance has been dropped, or the enclosure damaged.

Servicing:
The user should not attempt to service the appliance beyond that which is described in the operating instructions. All other servicing should be referred to qualified service personnel.

FOREWORD

Dear Customer,

Welcome to the team of BEHRINGER users and thank you very much for expressing your confidence in BEHRINGER products by purchasing the V-AMP PRO.

Writing this foreword for you gives me great pleasure, because it represents the culmination of many months of hard work delivered by our engineering team to achieve a very ambitious goal: to present you with an excellent virtual guitar amplifier, which gives you maximum flexibility and performance through its advanced sound and remarkable range of functions. The task of designing our new V-AMP PRO certainly meant a great deal of responsibility which we assumed by focusing on you, the discerning user and musician. Meeting your expectations also meant a lot of work and night shifts. But it was fun, too. Developing a product usually brings a lot of people together, and what a great feeling it is when all who participated in such a project can be proud of what they've achieved.

It is our philosophy to share our enjoyment with you, because you are the most important member of the BEHRINGER team. With your highly competent suggestions for new products you've made a significant contribution to shaping our company and making it successful. In return, we guarantee you uncompromising quality as well as excellent technical and audio properties at an extremely reasonable price. All of this will enable you to give free rein to your creativity without being hampered by budget constraints.

We are often asked how we manage to produce such high-quality devices at such unbelievably low prices. The answer is quite simple: it's you, our customers! Many satisfied customers mean large sales volumes enabling us to get better purchasing terms for components, etc. Isn't it only fair to pass this benefit on to you? Because we know that your success is our success too!

I would like to thank all of you who have made the V-AMP PRO possible. You have all made your own personal contributions, from the developers to the many other employees at this company.

My friends, it's been worth the effort!

Thank you very much,

Uli Behringer

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CAUTION!

☞ **Please note that high volume levels may cause permanent damage to your hearing and/or your headphones. Turn all LEVEL controls to the left before you switch on the unit. Be sure to keep the volume at an appropriate level.**

1. INTRODUCTION

Congratulations! With the V-AMP PRO you have acquired the professional 19" rack version of the V-AMP 2. Our ultimate aim in developing it was to create the authentic sound of classic guitar amplifiers by means of “physical modeling” and to combine this with the latest DSP effects.

The V-AMP PRO has a number of decisive advantages over its “little brother”, the V-AMP 2: the output signal can now be taken in digital form—and you can even select the output format. External synchronization of your V-AMP PRO is possible via word clock and, what is more, the V-AMP PRO features an additional analog speaker simulation, giving you unprecedented flexibility. But if you think the V-AMP PRO has been designed for guitarists only, you’re wrong: for example, with its innovative preamp bypass feature you can even use it purely as an effects processor. And thanks to its digital signal processing, the V-AMP PRO also works as an all-purpose A/D converter with an extremely low-noise, high-impedance input.

But enough of this talk. Nothing we say will convince you as readily as what you hear and feel when you test your V-AMP PRO for the first time. But...

1.1 ... before you get started

The V-AMP PRO was carefully packed at the factory and the packaging is designed to protect the unit from rough handling. Nevertheless, we recommend that you carefully examine the packaging and its contents for any signs of physical damage which may have occurred during transit.

☞ **If the unit is damaged, please do NOT return it to BEHRINGER, but notify your dealer and the shipping company immediately. Otherwise, claims for damage or replacement may not be granted.**

Be sure that there is enough space around the unit for cooling and, to avoid overheating, please do not place the V-AMP PRO near radiators etc.

☞ **Before you connect the V-AMP PRO to the mains, please make sure that the voltage setting on the unit matches the local voltage!**

The mains connection is made using the enclosed power cord and a standard IEC receptacle. It meets all of the international safety certification requirements.

☞ **Please make sure that all units have a proper ground connection. For your own safety, never remove or disable the ground conductor from the unit or of the AC power cord.**

The MIDI connections (IN, OUT/THRU) are for standard DIN connectors. Data is transferred via ground-free opto-couplers. Further information can be found in chapter 8 “INSTALLATION”.

1.1.1 Serial number

The V-AMP PRO’s serial number is located on the rear. Please take the time to fill in and return the warranty card within 14 days after the date of purchase, so as to benefit from our extended warranty. Or register online at www.behringer.com.

2. CONTROL ELEMENTS

2.1 Front panel

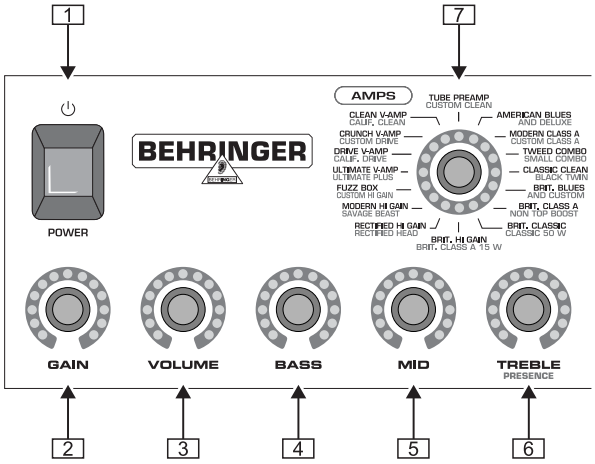

Fig. 2.1: V-AMP PRO front panel (section 1)

[1] Use the *POWER* switch to put the V-AMP PRO into operation.

[2] The *GAIN* control determines the distortion level of an amp simulation.

[3] The *VOLUME* control determines the volume of the selected preset.

[4] The *BASS* control in the EQ section is for boosting or cutting the low-frequency range.

[5] The *MID* control is for boosting or cutting the mid-range frequencies.

[6] *TREBLE* controls the high-frequency range of the selected preset.

☞ **If the TAP key [11] is down (see fig. 2.2), the TREBLE control functions as a PRESENCE control. This enables you to boost/cut a high-frequency filter tuned to whatever amp model is active, thus simulating the frequency-dependent coupling of tube amps.**

[7] The *AMPS* control is for selecting one of 32 different amplifier simulation models. The control is surrounded by a ring of 16 LEDs. Each LED corresponds to two types of amplifier. The first 16 simulations can be selected by turning the AMPS control (marked on the housing in: white).

To select the simulation models 17 - 32 (marked on the housing in: gray), press down the TAP key while making your selection by turning the AMPS control.

☞ **The LED “17 - 32” in the bottom left-hand corner of the DISPLAY indicates that one of the simulation models 17 - 32 has been selected.**

In addition, you can activate a PREAMP BYPASS by pressing the key combination TUNER and TAP. If PREAMP BYPASS has been selected, none of the LEDs on the AMPS control lights up. To disable PREAMP BYPASS, simply select a different amp model or press both keys again.

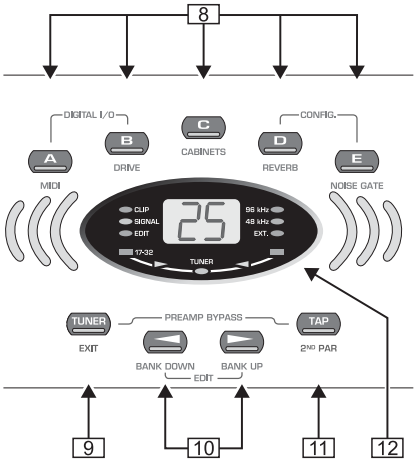

Fig. 2.2: V-AMP PRO front panel (section 2)

[8] These five keys are for selecting a preset (A - E) within one bank.

In EDIT mode (activated by simultaneously pressing the arrow keys described in [10]), the keys perform the function printed directly above them. As long as EDIT mode is active, the EDIT MODE LED lights up.

▲ A: Accesses the *MIDI* functions. Use the arrow keys to set the MIDI channels for transmitting and receiving (1 through 16).

If you use key A in EDIT mode to select the MIDI function and then press the TAP key, the MIDI OUT jack is set to act as a MIDI THRU. In this case, the V-AMP PRO does not send its own MIDI information, but passes on the signal received at the MIDI IN jack.

▲ B: Selects the *DRIVE* function. This noticeably raises distortion and volume. Use the arrow keys to switch DRIVE on and off. The DRIVE function is wired pre GAIN control.

☞ **While editing the DRIVE function, you can also activate and adjust the wah-wah effect by turning the EFFECTS control. The LEDs surrounding the EFFECTS control indicate the position of the pedal. If none of the LEDs lights up, the wah-wah is bypassed.**

▲ C: This key activates the *CABINETS* mode. Use the arrow keys to select the type of speaker or combination of speakers you want. You can also switch off the speaker simulation completely ("-"). For further details, please refer to chapter 5.2 "Speaker descriptions".

▲ D: Use this key to select the *REVERB* function. The arrow keys can be used to select one of nine different types of reverb in addition to the multi-effects processor. For further details see chapter 6.2.

▲ E: Here you can activate the *NOISE GATE* function. Use the arrow keys to adjust the noise reduction threshold.

☞ **After preset editing, please press TUNER/EXIT to quit (the EDIT MODE LED dies out).**

☞ **DIGITAL OUT: The digital output can be configured if keys A and B are pressed simultaneously. The display reads either "SP" for S/PDIF or "AE" for AES/EBU. Please switch between these two formats using the TAP key. The LEDs in the display illustrate, whether you have chosen internal synchronization (with 44.1, 48 or 96 kHz sample rate) or external synchronization via word clock (see tab. 2.1 in this user's manual). Use the arrow keys to select the appropriate sample rate with respect to the receiving device. The TUNER/EXIT key allows you to quit the DIGITAL OUT configuration.**

☞ **CONFIGURATION: If you press the D and E keys simultaneously, you can select the V-AMP PRO's general operating mode allowing adjustments to different studio and live situations (see chapter 3). Press TUNER/EXIT to quit configuration.**

[9] The *TUNER* button is for switching on the tuner. In addition, this button can be used to quit EDIT mode ("Exit").

[10] Use the two arrow keys to select a different bank (*BANK DOWN* and *BANK UP*). You can skip banks by holding each of the keys down. To activate the EDIT mode, press both keys simultaneously (THE EDIT MODE LED in the display lights up). if you press one of the keys A - E ([8]) in that mode, the arrow keys can be used for setting parameters.

[11] The *TAP* button performs five functions:

▲ **"Tap":** Tap the rhythm of a piece of music on the TAP button and the selected effect automatically adapts to the tempo of the music.

▲ **"Presence":** Holding down the TAP button, you can use the TREBLE control to change the PRESENCE setting of the amp simulation model you've selected.

▲ **"2nd parameter":** You also can access the second effects parameter set by the EFFECT control by holding down the TAP button (see chapter 6).

▲ **"Amp models 17 - 32":** Keep the TAP button pressed down and select an amp model using the AMPS control.

▲ **"MIDI Thru":** The MIDI OUT jack can be set to act as MIDI THRU (see [8] A).

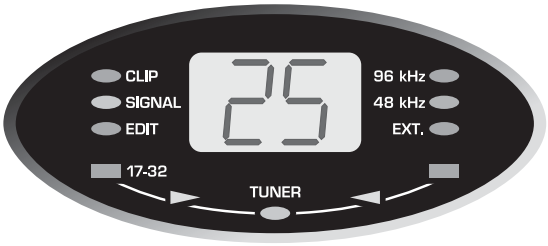

Fig. 2.3: V-AMP PRO display

Clock	LED ext.	LED 48 kHz	LED 96 kHz
internal 44.1 kHz	-	-	-
internal 48 kHz	-	✓	-
internal 96 kHz	-	-	✓
external (any frequency)	✓	-	-

Tab. 2.1: Output formats and display LED assignments

[12] The *DISPLAY* shows you what preset bank you have selected and gives you information on parameter changes when you are editing. In TUNER mode the DISPLAY shows the pitch of the instrument connected to the unit. If one of the amplifier simulations 17 - 32 has been selected, the LED in the bottom left-hand corner of the DISPLAY lights up. Additionally, the DISPLAY reads the digital format output and the sample rate of your V-AMP PRO and illustrates whenever the V-AMP PRO is synchronized by an external word clock signal. Applied signals are indicated by the SIGNAL LED, overload signals by the red CLIP LED.

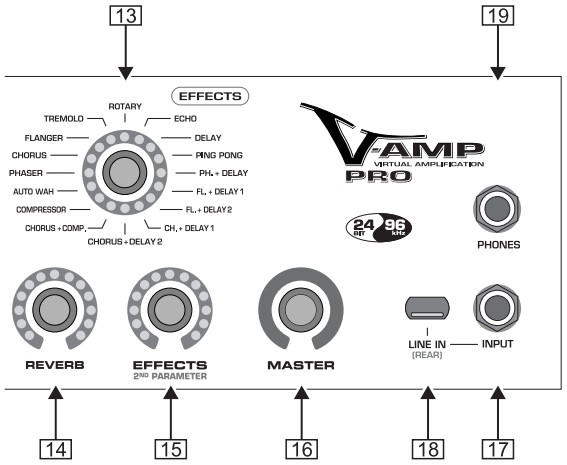

Fig. 2.4: V-AMP PRO front panel (section 3)

13 This control is for selecting an effect or a combination of effects. This encoder-type rotary control is also surrounded by a ring of 16 LEDs. Each LED corresonds to one specific effects preset.

14 Using the *REVERB* control, you can add the reverb content of your choice to your overall sound. By turning it to the left until all the LEDs are off, you deactivate the reverb. To fade out the original signal, turn the control to the right until only the last LED lights up.

15 If an effect has been selected via 13, its part of the overall sound can be set using this *EFFECTS* control. If you select the "Compressor" effect, you can use the EFFECTS control to adjust the compression intensity. Turning the control to the left until all the LEDs are off disables the effect. This is known as an effects bypass.

☞ **By pressing the TAP key, you can set a second effects parameter using the EFFECTS control (see tab. 3 on the separate sheet).**

16 The *MASTER* control determines the overall volume of your V-AMP PRO.

☞ **This is the only "conventional" control on the V-AMP PRO. All the other controls are encoder-type rotary controls whose settings can be stored in a preset.**

☞ **The LED rings around the VOLUME, BASS, MID, TREBLE, GAIN, EFFECTS and REVERB controls each have nine LEDs. On each ring either one LED or two neighboring LEDs will light up at a time, indicating a total of 17 different positions.**

17 The *INPUT* socket is the V-AMP PRO's 1/4" jack socket for your guitar. Please use a standard 1/4" mono jack cable.

18 The *LINE IN* switch determines which signal source is processed by the V-AMP PRO, either (switch not pressed) the signal applied at the high-impedance INPUT jack, for example, your guitar, or (switch pressed) the line signal connected to the PRE DSP INSERT (LINE IN, 20).

19 The stereo *PHONES* jack allows you to monitor the V-AMP PRO's audio signal with standard headphones.

☞ **When you connect your headphones, the V-AMP PRO automatically activates studio mode 1 (S1). If the current preset or setting does not have a cabinet model, the V-AMP PRO will also select a default speaker simulation automatically, as soon as you plug in your headphones. This improves the aural impression when using headphones. The standard cabinet simulations are shown in table 4 (enclosed sheet). However, you can intentionally change or deactivate the simulation when using headphones by selecting "-" in the CABINETS mode.**

2.2 Rear panel

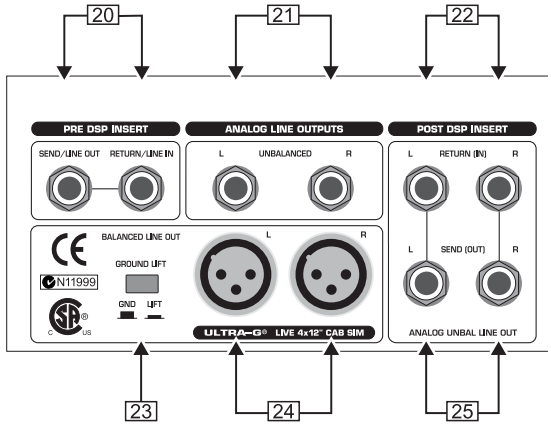

Fig. 2.5: V-AMP PRO rear panel (section 1)

20 Your V-AMP PRO features a serial insert path for external effects, such as a wah-wah pedal. Connect the *SEND/LINE OUT* jack to the input of your effects device. The SEND/LINE OUT output is taken directly pre-digital processor (PRE DSP), which means you can use this jack also to record a "dry" direct signal without any effect added.

Connect the *RETURN/LINE IN* jack to the output of your external effects device.

☞ **When using the serial insert path, please do not set the effects device to 100% effects signal ("wet"); otherwise, the direct signal will be missing.**

☞ **Press the LINE IN key 18 to route the signal applied at the RETURN/LINE IN to the V-AMP PRO. This function is useful, for example, to monitor a "dry" guitar signal with the V-AMP PRO before adding any effects (see enclosed sheet, fig. 1).**

21 The *ANALOG LINE OUTPUTS* provide the stereo signal of your V-AMP PRO without analog speaker simulation applied. Use this jacks, for example, to connect an external amp on stage.

22 Connect the *POST DSP INSERT RETURN (IN)* pair of stereo 1/4" jacks to the outputs of the external stereo effects device and use this path to return the signal sent out from the POST DSP SEND (OUT) outputs 25.

23 The *GROUND LIFT* switch disconnects (switch pressed) the ground connection at the DI OUT outputs 24 to effectively eliminate hum noise resulting from ground loops.

24 The *DI OUT* output provides the balanced stereo signal of your V-AMP PRO. Connect this output to two balanced channel inputs on your mixing console.

25 The *POST DSP SEND (OUT)* stereo output allows you to connect the inputs of an external stereo effects device. The signal provided here is the same as the signal present at the digital outputs. Unlike the SEND/LINE OUT output 20 this signal is post-DSP. If the two corresponding RETURN (IN) jacks 22 are not used, the ANALOG LINE OUTPUTS 21 provide an identical signal.

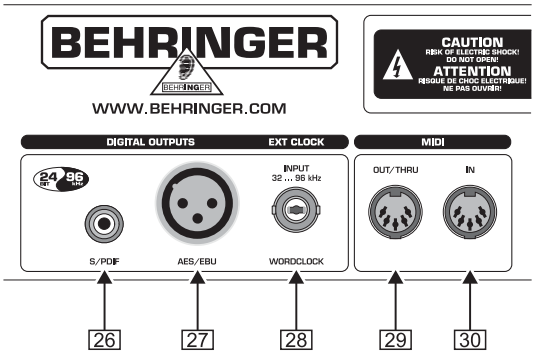

Fig. 2.6: V-AMP PRO rear panel (section 2)

[26] The *S/PDIF* output provides the digital output signal of your V-AMP PRO.

[27] The *AES/EBU* output (XLR connector) provides the digital output signal of your V-AMP PRO in an AES/EBU format, provided that AES/EBU has been selected as digital output format (please refer to the 2nd note under [8] E).

[28] The *WORDCLOCK* BNC jack is used to connect equipment for the external synchronization of your V-AMP PRO. This high-impedance jack has no internal terminating resistor (75 Ohms).

[29] This is the *MIDI OUT/THRU* jack of your V-AMP PRO. It is configured as MIDI OUT but can be set to act as a MIDI THRU jack (see [8] A).

[30] Use the *MIDI IN* to connect a foot controller, for example, the BEHRINGER MIDI FOOT CONTROLLER FCB1010. See also chapter 8.4.

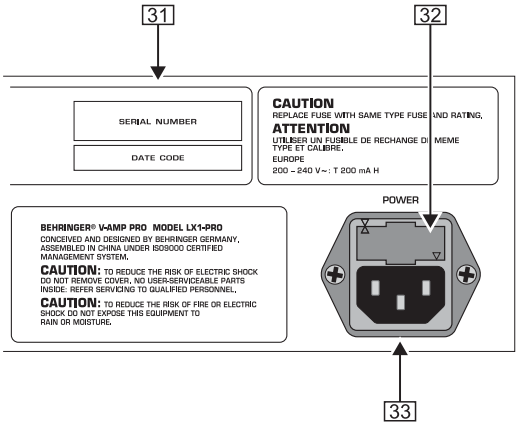

Fig. 2.7: V-AMP PRO rear panel (section 3)

[31] *SERIAL NUMBER*. Please take the time to fill in and return the warranty card within 14 days after the date of purchase, so as to benefit from our extended warranty. Or register online at (www.behringer.com).

[32] *FUSE HOLDER/VOLTAGE SELECTOR*. Before connecting the unit to the mains, make sure that the voltage setting matches your local voltage. A blown fuse should only be replaced by a fuse of the same type and rating. On some units, the fuse holder can be switched to one of two positions, i.e. 230 V and 115 V. When operating the unit outside Europe at 115 V, a higher fuse rating is required (see chapter 8 "INSTALLATION").

[33] The mains connection is on an *IEC* receptacle. An appropriate power cord is included.

3. EXAMPLES OF OUTPUT CONFIGURATIONS

To adapt the V-AMP PRO best to different studio and live situations, you can select between five operating modes (CONFIGURATION). Regardless of the settings on the unit itself, these modes determine in which way the V-AMP PRO's output signal is taken. Basically, there are 3 studio and 2 live operating modes (with additional EQ). This also allows for using the left and right output signals differently at the same time. In operating mode "Live 2", it is necessary to distinguish between the balanced XLR outputs (DI OUT) and the 1/4" jack outputs (UNBALANCED).

3.1 Selecting CONFIGURATION modes

Your V-AMP PRO left the factory set in "Studio 1" (S1) mode. To change modes, you have to switch to CONFIGURATION mode. To do this, press buttons D and E simultaneously. Use the arrow keys to switch from one mode to another. Press TUNER to quit CONFIGURATION mode.

3.2 Standard set-up with MIDI foot controller and (optional) recording system

Set up and wire your V-AMP PRO as shown in fig. 1 on the enclosed sheet. Connect your headphones to the PHONES jack if required. The MIDI foot controller enables you to select programs, enable/disable the tuner and control the wah-wah effect (see chapter 10).

☞ **For this application please select CONFIGURATION mode S1!**

☞ **To monitor the recorded signal please press button [18]!**

3.3 Hard-disk recording studio

A widely used recording application is to make a "dry" recording of the output signal while monitoring the signal with effects (see fig. 2 on the enclosed sheet). The advantage here is that you don't have to make a final decision on what effect to use during mix-down. For this purpose, connect the left output of the V-AMP PRO to the recording device, and use the right output for monitoring (with effects).

If you have a MIDI foot controller, you can use it to control preset, bank and amp model changes. It is also convenient for switching the tuner on and off.

☞ **If you select CONFIGURATION mode S2 for this application, the cabinet simulation is active both on the left and right channels.**

☞ **Please select CONFIGURATION mode S3 to use the left output without cabinet simulation!**

3.4 Live set-up in combination with a full-range monitor system

When you're playing on stage, it is extremely important to monitor your guitar sound properly. To this end, the V-AMP PRO is ideally connected to a monitor system with sufficient power to reproduce the V-AMP PRO's sound potential to the full (see fig. 3 on the separate sheet).

☞ **For this application, please select mode L1 under CONFIGURATION. The additional 3-band EQ can be set with the BASS, MID and TREBLE controls. As this is a global EQ, it has no effect on the setting of these three controls stored with a preset.**

☞ **When headphones are connected, the V-AMP PRO selects operating mode S1 automatically.**

3.5 Live set-up with P.A. system and your own guitar amp on stage

This application is intended to give you your own guitar signal on stage so that you can have complete control of intentionally produced feedback, for example. Use the UNBALANCED LINE OUTPUTS to drive the guitar amp, and the 3-band EQ plus effects on this output (but no cabinet simulation!) to optimize the sound. The DI OUT provides a DI signal for the FOH mixing console—with effects and ULTRA-G cabinet simulation!

☞ **For this application, please select CONFIGURATION mode L2!**

4. V-AMP PRO PRESETS

The V-AMP PRO features 125 overwritable presets divided into 25 banks. In other words, there are five presets available per bank. Each preset consists of a maximum of five "ingredients":

- ▲ amp simulation (including GAIN, EQ and VOLUME settings)
- ▲ cabinet simulation
- ▲ pre-amp effect, such as noise gate, compressor, auto wah and wah-wah
- ▲ post-amp multi-effect, such as delay, modulation effect, or a combination of both
- ▲ reverb effect

The enclosed sheet shows an overview of all the presets on your V-AMP PRO.

4.1 Calling up presets

When the unit is switched on, it automatically loads the preset used last. In the following example, the last preset selected was preset D in bank 25:

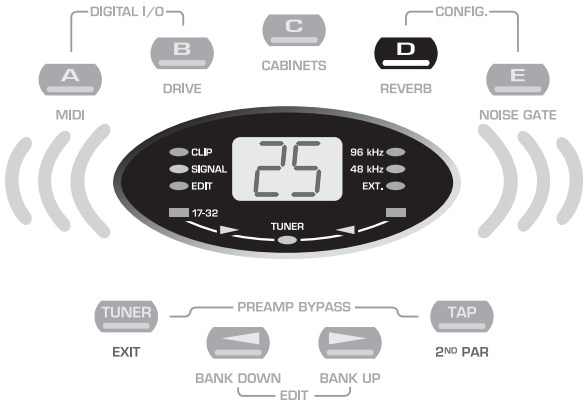

Fig. 4.1: Calling up presets

In this case, by pressing button A, B, C or E you can immediately call up another preset of the same bank. The two arrow keys (BANK UP and BANK DOWN) enable you to switch banks. The display on the V-AMP PRO always shows which bank has been selected. When you switch banks, the preset has to be called up by pressing one of the buttons A - E. One LED lights up to show you which preset in the respective bank has been activated.

Operating mode	Function		Applications
	OUTPUTS L	**OUTPUTS R**	
Studio 1 (S1)	**Stereo operation** with selected effects and speaker simulations.		▲ Recording situation (see fig. 1 & 2 on separate sheet). ▲ V-AMP PRO as practice amp (e.g. with headphones).
	OUTPUTS L	**OUTPUTS R**	
Studio 2 (S2)	(dry signal with speaker simulation. Effects: compressor and auto wah only).	(with speaker simulation, modulation, delay and reverb effects).	▲ Recording situation: with the left output connected to the recording device. The right output is used for monitoring only (with effect). Advantage: while recording, you don't have to specify the effect used during mix-down, but can still monitor wet signals (see fig. 2 on separate sheet).
	OUTPUTS L	**OUTPUTS R**	
Studio 3 (S3)	**Left** (dry signal, **without** cabinet simulation).	**Right** (with modulation, delay and reverb effects **plus** cabinet simulation).	
	OUTPUTS L	**OUTPUTS R**	
Live 1 (L1)	**Stereo operation** + additional 3-band EQ and **with** cabinet simulation.		▲ Here, the V-AMP PRO can be connected to a monitor system. The additional EQ (BASS-, MID- & TREBLE controls) allows you to match the sound to the amplifier used (see fig. 3 on the separate sheet).
	OUTPUTS L (except for XLR)	**OUTPUTS R (except for XLR)**	
Live 2 (L2)	**Stereo operation** + additional 3-band EQ, but **without** cabinet simulation.		▲ V-AMP PRO as preamp, with the line outputs connected to a stereo line input of your guitar amp. The additional EQ (BASS, MID & TREBLE controls) allows you to match the sound to the amplifier used. However, with no cabinet simulation activated, the loudspeaker(s) of the guitar amp used will influence the sound. The XLR outputs function as DI output and are connected to the mixing console or stagebox respectively. Thus, they determine the F.O.H. mix (see fig. 4). Here, our ULTRA-G 4x12" loudspeaker simulation is activated automatically.
	XLR DI OUT L	**XLR DI OUT R**	
	Stereo operation + additional 3-band EQ, but **with analog** ULTRA-G cabinet simulation.		

Tab. 4.1: V-AMP PRO modes with application examples

4.2 Editing presets

Editing presets is fast and simple with the V-AMP PRO. One option is to call up a preset you like and then start editing it. Select an amp model by means of the AMPS encoder. The LED on the preset button flashes (e.g. D) and signals that you have made a change to the preset.

Now change the settings of the VOLUME, BASS, MID, TREBLE and GAIN controls as you like. If you select an effect, you can adjust its ratio in the overall sound using the EFFECTS control. You then switch to EDIT mode by pressing the arrow keys simultaneously. If you use buttons B - E to activate the DRIVE, CABINETS, REVERB and NOISE GATE functions respectively and then edit using the arrow keys, the value of the respective parameter is shown in the display. To leave EDIT mode, briefly press the TUNER button.

If you hold the TAP button down while using the TREBLE control, you can raise or lower an additional high-frequency filter (PRESENCE). This simulates the frequency-sensitive coupling of tube amps.

☞ **Apart from compressor and auto wah, all the multi-effects have a speed-based parameter. Say you want to set the effect you've selected to the tempo of your playback: just tap the TAP button twice in time to the music and the effect tempo will match the tempo of your piece.**

4.3 Storing presets

To store your edited preset, hold down the preset button required for approx. 2 seconds for the preset to be overwritten (the corresponding LED lights up throughout).

☞ **You do not necessarily have to store your edited preset in place of the original preset selected. If you choose a different storage position, select the preset bank you want using the arrow keys (BANK UP and BANK DOWN). You can store your changes by holding down the preset button for approx. two seconds. For example, you can edit a preset originally stored in bank 5, position D, and then store it in bank 6, position A.**

4.4 Discarding an edited preset/restoring a single factory preset

If you have edited a preset and find that you don't like the edited version, you can, of course, discard it. Let's assume you've selected and then edited preset C (the corresponding LED has lit up), but you would now like to return to the configuration stored previously. Simply select another preset. The next time you call up the preset, the temporary edited version is discarded. After editing, you can also hold down the two arrow keys until "Pr" appears in the display, which brings back the factory preset that was originally stored there. However, you then have to save it again by holding down the corresponding preset button for approx. two seconds.

4.5 Restoring all factory presets

All factory presets can be restored as follows: Hold down buttons D and E and then switch on the V-AMP PRO. "CL" appears in the display. Now release the two buttons and press the two arrow keys simultaneously. This erases all the edited presets you have stored and restores the factory presets.

5. AMP/SPEAKER SIMULATION

The very heart of your V-AMP PRO is its amp/speaker simulation. The 32 simulation models can make work in a home recording studio very much easier because it isn't necessary to mike up the guitar amp. The V-AMP PRO makes it child's play for you to choose one of the legendary guitar amps, be it for Brit Pop, Blues, Heavy Metal or whatever. In addition, you can tailor the sound of the respective amp to suit your ideas and then connect it virtually to one of 15 speaker simulations (cabinets). On top of all that, you can even choose digital effect and reverb types for your virtual amp. See chapter 4 "V-AMP PRO PRESETS" for more details.

When you switch on the V-AMP PRO, it automatically loads the last preset selected. The LED ring around the AMPS control shows what amp has been selected. The corresponding LED lights up. To select another amp simply turn the control. Use the VOLUME, BASS, MID, TREBLE and GAIN controls to modify the basic sound of the amp. Hold down the TAP button and turn the TREBLE control to raise or lower an additional high-frequency PRESENCE filter (see 6).

As a rule, you will want to select an amp first, then a cabinet and finally an effect. See chapter 4 for how to store your modifications. To give you a better overview of the extensive range of amp simulations on the V-AMP PRO, we have compiled the following descriptions of the different types of amp.

☞ **When you select an amp simulation, an appropriate speaker simulation is activated automatically (see tab. 4 on the separate sheet). Otherwise, the authenticity of the sound could be affected by an unsuitable cabinet—especially if you are using headphones. Naturally, you can combine the amp simulations with other cabinets according to taste.**

5.1 Amp descriptions

AMERICAN BLUES: This virtual amp is modelled on the Fender Bassman 4 x 10 Combo. Originally designed as a bass amp, it soon became a standard amp of blues legends such as Steve Ray Vaughan or Billy Gibbons due to its characteristic distortion. As you would expect, it packs a solid punch in the bass range, but is still flexible enough in the mid and treble ranges.

AND DELUXE: A synthesis of a 1960 Fender Blackface Deluxe and a '50s Fender Bassman. The result is a crystal-clear sound that still simlates the edge of the vintage amps. The V-AMP PRO sound control gives you even greater scope than the EQ controls on the originals.

MODERN CLASS A: This amp is characterized by its slight distortion and sounds almost like hi-fi. It is modelled on the Matchless Chieftain, a very expensive, hand-made amp.

CUSTOM CLASS A: The model for this simulation is the Budda Twinmaster. This Class-A amp is renowned for its warm sound combined with irresistible tube distortion. Although the original amp does not have a mid control, we have given the V-AMP PRO the capability of suiting the mid range to your taste.

TWEED COMBO: This was Jeff Beck's favorite when he recorded the albums *Blow by Blow* and *Wired*. This amp was not actually designed for heavy distortion, but due to its low power, it is ideal for uncompromising overdrive sound.

SMALL COMBO: This model is based on the 1960 Tweed Champ. The main attraction of this amp simulation is when the DRIVE function is used a lot. Although this amp was actually designed for beginners on the guitar, it soon became a favorite amp of many guitar afficionados. The reason for that was that it produced an amazingly distorted sound even at low volume. The Tweed Champ had a volume control, but no EQ control. If you want to get the most authentic sound out of this amp, keep the sound control on the V-AMP PRO in the mid-range.

CLASSIC CLEAN: Back in the ’80s, the Roland JC-120 was the preferred sound of Buzzy Feiten (guitarist with the Dave Weckl Band). The unique quality of this transistor amp’s sound is the way its brilliance cuts through any mix. It is ideal for the New Wave sound of the 80s that is making a come-back today. By the way, the JC-120 was also popular among Fender Rhodes pianists.

BLACK TWIN: This simulation was modeled on a Fender Blackface Twin from 1965. In the ’60s this amp was used by jazz, country and even rock guitarists. What was unique about it was that it was exceptionally loud and was therefore mainly used for live performances. The secret of the Blackface Twin was that although you could play it extremely loud, the distortion remained relatively low.

BRITISH BLUES: Modeled on the JTM 45, the first Marshall amp ever. This, by the way, was Eric Clapton’s favorite amp when he was with Cream. The JTM 45 was the forerunner of many of Marshall’s later amps with their distinctive, powerful sound. Extreme gain settings produce a highly compressed and really “dirty” sounding distortion. Combined with a 2 x 12" speaker simulation it produces impressive Bluesbreaker sounds.

AND CUSTOM: This simulation is based on a 1965 Marshall JTM 45 Bluesbreaker but has more flexibility of sound control. Turn the GAIN control to the left and this simulation sounds like a Marshall; turn it to the right and it is more reminiscent of the Budda.

BRITISH CLASS A: This simulation is modeled on the Vox AC 30. This amp was originally designed in the ’60s when guitarists wanted amps with enhanced brilliance, a feature that Vox successfully implemented by means of “revolutionary” bass and treble controls. Brian May and U2’s The Edge are probably the best-known users of this sound.

NON TOP BOOST: This is a Vox AC 30 as used by Bryan Adams in the recording studio. Unlike the well-known AC 30 with treble boost, the former amp version did not have this feature. This simulation copies the original amp’s “normal” channel.

BRITISH CLASSIC: Based on a 1959 Marshall Plexi 100 Watt, this amp is ideal for producing clean sounds. It was used by Jimi Hendrix, Eric Clapton and Jeff Beck.

CLASSIC 50 W: This is also a Plexi, but we have extensively widened its sound range. The sound controls on the original Marshall Plexi 50 Watt hardly had any effect on the sound if distortion was high.

BRITISH HI GAIN: Compare this model with a Marshall JCM 800. Although the original was renowned mainly for its distorted sounds, this amp also sounds very good with low gain settings. It’s good at reproducing Steve Ray Vaughan’s and Michael Landau’s sounds. In distortion mode it sounds like Gary Moore in his early days, but it’s also good for heavy metal.

BRITISH CLASS A 15 W: Another Vox model, based on the first channel of an AC 15 from 1960. Unlike the AC 30 this amp had only one 12" speaker, instead of two, and produced a warmer sound. Tip: to make this simulation sound as authentically as possible, leave the BASS and MID controls in mid-travel position and vary the TREBLE control only.

RECTIFIED HI GAIN: This model is based on a 1994 Mesa Boogie Dual Rectifier Trem-O-Verb featuring a modern, high-gain sound that also comes over well in a band context. The tone control is post-gain, which allows you to tailor distorted sounds to great effect. This amp is perfect for heavy metal, but also for Steve Lukather sounds. The best-known user of this amp is Dream Theater’s guitarist John Petrucci.

RECTIFIED HEAD: This simulation is modeled on a Mesa Boogie Dual Rectifier top. Unlike the Trem-O-Verb, this amp produces a more modern high-gain sound. The tone control is most effective at high gain settings.

MODERN HI GAIN: Here, too, the tone control is post-gain, allowing the extremely distorted sound to cut through the mix. The MODERN HI GAIN sound is ideal for playing Grunge, but is also used by guitarists such as Steve Vai and Joe Satriani. Among others, Steve Lukather, Nuno Bettencourt and Steve Vai have all popularized the Soldano sound. If you’re playing a Gibson Les Paul, MODERN HI GAIN sounds best when you turn down the volume control on the guitar a little.

SAVAGE BEAST: Engl is well-known for amps that really cut through. The Savage 120 in particular has built up a large following among guitarists. For some time now Ritchie Blackmore has been an major endorser of this German company, and Randy Hanson, the best Hendrix since Jimi, also swears by this amp. The unique feature of the Savage is its extreme power and is therefore highly popular with heavy metal guitarists. Silent Force/Sinner guitarist Alex Beyrodt has been an enthusiastic Engl user for years. An amp for making yourself heard!

FUZZ BOX: This sound is not actually based on any one amp, but on a particular fuzz box. Jimi Hendrix was one of the first guitarists to recognize the potential in this legendary broadband transistor distortion. The humming distortion sound of the FUZZ BOX has returned to popularity with Alternative Rock and Grunge.

CUSTOM HI GAIN: This sound goes back to a 1969 50-Watt Marshall Plexi modified by Jose Arrendondo. Arrendondo was none other than Eddie Van Halen’s guitar technician. The unique features of this amp are its fine mid-range sounds and its ability to produce the ultimate in gain without making the sound muddy. Warning: highly addictive!

ULTIMATE V-AMP: From clean to brutal hi-gain, this “brute” covers the entire range. The ULTIMATE V-AMP is basically a souped-up rectifier amp.

ULTIMATE PLUS: Those who find the ULTIMATE V-AMP too tame will find enough gain here for an overdose.

DRIVE V-AMP: This simulation is based on a more modern high-gain lead amp producing a soft but precise sound with plenty of drive, making it ideal for lead guitar work. The DRIVE V-AMP is modeled on the Mesa Boogie Mark III.

CALIFORNIA DRIVE: Based on the Mesa Boogie Mark II c, this is purely a simulation of its drive channel—definitely the right choice for Santana songs.

CRUNCH V-AMP: This amp is ideal for modern blues or jazz. Its sound is not too subtle, but not in-your-face either—it’s crunchy, that’s all.

CUSTOM DRIVE: This simulates the Dumble Overdrive Special—an amp that was at the top of many guitarists’ wish-list but beyond their financial means. Dumble amps are hand-made and can be custom-built for the individual guitarist. What we’ve done here is simulate the drive channel of one of these rare Dumble amps.

CLEAN V-AMP: Here we have managed to simulate the sound of a Roland JC-120 and comine it with our BRIT CLASSIC model. The result is the brilliance of a transistor amp which, however, features the cutting power of a Marshall Plexi. Turn the GAIN control clockwise and the Marshall comes in.

CALIFORNIA CLEAN: This model is based on the clean channel of the Mesa Boogie Mark II c. It sounds a little like a Fender, but has more of a punch in the mid-range.

TUBE PREAMP: Sound engineers were quick to recognize the appeal of tubes. They used tube amps to add warmth to all kinds of sounds. This amp model is not only for refining guitar sounds. Try putting a vocal track through the V-AMP PRO and give it the finishing touch with TUBE PREAMP.

CUSTOM CLEAN: This simulation is of the clean channel on our Dumble amp.

PREAMP BYPASS: In this setting, no amp simulation is selected. This makes it possible, for example, to play through an external guitar preamp and only use the effects or the speaker simulation on the V-AMP PRO. To activate the PREAMP BYPASS, press TAP and TUNER.

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5.2 Speaker descriptions

The sound of any guitar combo depends largely on the type and combination of speakers used. In the past 50 years there has been widespread experimentation to find out what type of speaker is best suited to any one specific guitar sound and in what way the sound is modified when a certain speaker is combined with others.

☞ **When you select an amp simulation, an appropriate speaker simulation is activated automatically (see tab. 4 on the enclosed sheet). Otherwise, the authenticity of the sound could be affected by an unsuitable cabinet—especially if you are using headphones. Naturally, you can combine the amp simulations with other cabinets according to taste.**

The character of a loudspeaker is a combination of its power rating, impedance, sound pressure and size, as well as the material it is made of. 8", 10" and 12" speakers have established themselves as the best sizes for electric guitar amplification. The enclosed sheet shows a list of all speaker cabinets on the V-AMP PRO (tab. 2).

6. EFFECTS PROCESSOR

A special feature of your V-AMP PRO is its built-in multi-effects processor module offering 16 different groups of first-class effects such as chorus, flanger, delay, auto wah as well as various combinations of effects. The MIDI function also allows you to use an additional wah-wah effect which can be controlled best using a MIDI foot controller with an expression pedal, such as our BEHRINGER MIDI FOOT CONTROLLER FCB1010. See tab. 10.1 in this user's manual for an overview of all MIDI data transmitted and received by the V-AMP PRO.

☞ **The standard operating mode of the multi-effects processor is stereo, so you can use stereo effects for recording purposes via the LINE OUT or play in stereo using a second amplifier.**

The effects on the V-AMP PRO can be modified in three parameters: by turning the EFFECTS control, by turning the EFFECTS control and holding down the TAP button, and by pressing the TAP button alone in time to the music. Tab. 3 on the enclosed sheet shows the effect parameters for the V-AMP PRO.

☞ **To match speed-based effects to the tempo of the music, please press the TAP button twice in time to the music.**

6.1 Effect descriptions

The following section contains short descriptions of the effects that can be produced using the multi-effects processor in your V-AMP PRO.

Reverb and delay algorithms

REVERB: Reverb is still the most important effect for mixing or live performance. That's why we at BEHRINGER make a point of giving you as many as nine different reverb programs so that you can use the most suitable reverb program for any situation. The reverb effect can be added separately to all the other effects (see chapter 5.2).

ECHO: Echo is like the stereo delay effect in that it is a delayed repetition of the input signal, apart from the fact that the high-frequency content of the repeated signals steadily decreases. This simulates a tape delay used in the pre-digital era, producing a "vintage sound". In addition, the reflections are routed in turns to the left and right channels, creating a quasi-stereo effect.

DELAY: This algorithm delays the input signal, with different tempo settings producing interesting delay effects. U2's The Edge has impressivley demonstrated the potential of this effect.

PING PONG: A delay effect that changes position on the stereo channels.

Modulation effects

PHASER: The principle behind the phaser is that a second, phase-shifted signal is added to the audio signal. This makes the sound richer and, above all, livelier. This effect is popular among guitarists and keyboard players alike, but was also used extensively in the '70s with other instruments, such as electric pianos. Depending on how you set it, the V-AMP PRO phaser can be used to produce slightly modulating or strongly alienating effects.

FLANGER: This effect is self-explanatory. Originally, the flanger effect was produced by running two synchronized tape recorders at the same time. The same signals (e.g. a guitar solo) were recorded on both machines. Putting a finger on the left reel of one of the machines caused it and the speed of the playback to slow. The resulting delay produced phase shifts of the signals.

CHORUS: This effect adds a slightly modulated off-key element to the original signal, thus creating a pleasant floating effect through variations in pitch.

Combinations of effect algorithms (multi-effects programs)

PHASER & DELAY: Phaser and delay combined.

FLANGER & DELAY: Here the input signal is delayed and processed with a pronounced wave-like effect. It is particularly effective for highlighting single notes, but can also be used to make solos more interesting.

CHORUS & DELAY: This algorithm combines signal delay with the popular chorus effect.

CHORUS & COMP: Incredible sustain effects can be produced with the compressor. This is especially useful for sustaining individual guitar notes. Combined with chorus, it can make the audio signal extremely dense.

Special effects

COMPRESSOR: A compressor limits the dynamic range of the audio material, thus producing audible and creative sound effects. Pronounced use of the compressor (using the EFFECTS control) allows you to compress the overall dynamic range of the material.

AUTO-WAH: The legendary wah-wah effect owes its fame mainly to Jimi Hendrix. Describing it is certainly more difficult than simply listening to Hendrix using it on Voodoo Chile. In American funk music of the '70s you can hear auto-wah effects used in a variety of applications. The auto-wah alters its filter frequency automatically depending on the signal's magnitude, rather than being controlled by the position of a pedal.

TREMOLO: Simulates the classic Fender Tremolo. It has returned to popularity with trip-hop.

ROTARY: This is the quintessential simulation of the classic organ effect normally produced by speakers rotating at slow or fast speed in an extremely heavy speaker cabinet. This effect uses the physical principle of the Doppler effect to modulate the sound.

NOISE GATE: Noise gates are used to remove or reduce noise or other interference. Guitar signals in particular are very sensitive to interference. Not only do guitarists often use high-gain settings but guitar pick-ups can amplify unwanted interference. This can be painfully apparent during breaks in the music. And how does a noise gate work? It simply mutes the signal during breaks, eliminating any interference at the same time.

6.2 The separate reverb effect

The reverb effect from your V-AMP PRO is independent of the multi-effects processor and can be added to the mix signal at any time. To edit the REVERB function, press button D in EDIT mode (pressing the two arrow keys simultaneously) and use the two arrow keys to select one of the nine different reverb types available (see enclosed sheet for further details).

7. TUNER

Press the TUNER button to activate the built-in tuner.

7.1 Tuning your guitar

The chromatic tuner automatically recognizes the frequencies of all the standard guitar notes. For the A-string this means a frequency of 220 Hz. When you plug your guitar into the V-AMP PRO and play an open string, the tuner will recognize and display the note. Since the tuner uses an auto-chromatic scale, it can also recognize semi-tones, which are shown with a "b" in the display.

It may happen, however, that a note is displayed as "A" but is actually slightly out of tune. This is shown by at least one of the four LEDs at the foot of the display lighting up. In certain cases even two of the LEDs may light up, which indicates that the pitch of the note played lies between the pitches represented by the two LEDs. When the circular tuner LED in the middle lights up, this means the note played is in tune.

7.2 Setting reference pitch "A"

To give you maximum freedom for tuning your guitar, you can change the preset reference pitch "A". For clarity's sake, let's look at this in more detail.

The so-called concert pitch "A" has been raised steadily over time. For example, the tuning forks used by Bach, Händel or Mozart were 415, 420 or 421 Hz (oscillations per second). Today's orchestras tune to "A" at 444 Hz, and the Berlin Philharmonic Orchestra lead the field with their own concert pitch "A" at 447 Hz.

The reference "A" on your V-AMP PRO has been factory-programmed at 440 Hz. If you are going to play with a big orchestra tuning their instruments to a reference pitch of 444 Hz, you will need a function that allows you to change your reference pitch. To activate this function, switch on the tuner by pressing the TUNER button and switch to EDIT mode by pressing the two arrow keys simultaneously. The display will show "40", which means 440 Hz. Use the arrow keys to raise or lower the reference pitch by up to 15 Hz. The display always shows the last two digits as the first digit is always 4. For example, if you start with a reference pitch of 440 Hz and press the right-hand arrow three times, the display will read 43, i.e. 443 Hz. To quit EDIT mode, press either the TUNER or the TAP button. Any changes will be stored automatically. The tones for the other strings on your guitar will automatically be adjusted to the new reference pitch.

8. INSTALLATION

8.1 Rack mounting

The BEHRINGER V-AMP PRO requires two height units (2 HU) for installation in a 19" rack. Please allow an additional 4" of rack depth for the rear panel connectors.

Be sure that there is enough air space around the unit for cooling. To avoid overheating, do not place the unit on power amps, for example.

8.2 Mains voltage

Before you connect the V-AMP PRO to the mains, please make sure that the voltage setting on the unit matches the local voltage! The fuse holder at the AC power connector has 3 triangular markings. Two of these three triangles are aligned with one another. The unit is set to the voltage shown next to these markings and can be switched over by turning the fuse holder by 180°. **IMPORTANT: This does not apply to export models designed exclusively for 115 V operation!**

☞ **If you set the unit to a different mains voltage, be sure to use a fuse of the correct type and rating. Please refer to chapter 9 "SPECIFICATIONS" for details.**

☞ **Blown fuses must be replaced by fuses of the same type and rating! Please refer to chapter 9 "SPECIFICATIONS" for details.**

The mains connection is made using the enclosed power cord and a standard IEC receptacle. It meets all of the international safety certification requirements.

☞ **Please make sure that all units have a proper ground connection. For your own safety, never remove or disable the ground conductor from the unit or of the AC power cord.**

8.3 Audio connections

The input of your BEHRINGER V-AMP PRO is a mono 1/4" jack. All line out, line in and headphones outputs are 1/4" stereo jacks. The line outputs work with both balanced and unbalanced connections. The DI OUT outputs are on XLR connectors.

The digital outputs are on a cinch jack (S/PDIF) or XLR connector. The BNC jack is used to feed in external word clock signals.

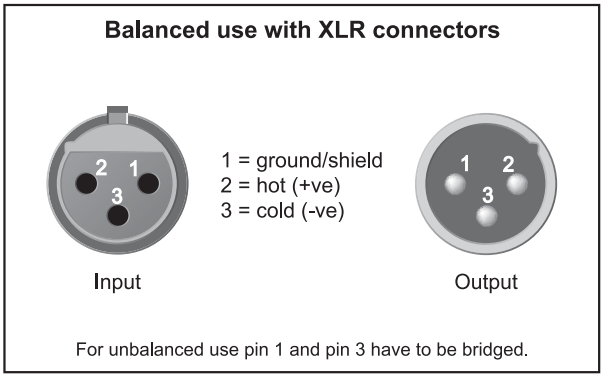

Fig. 8.1: XLR connectors

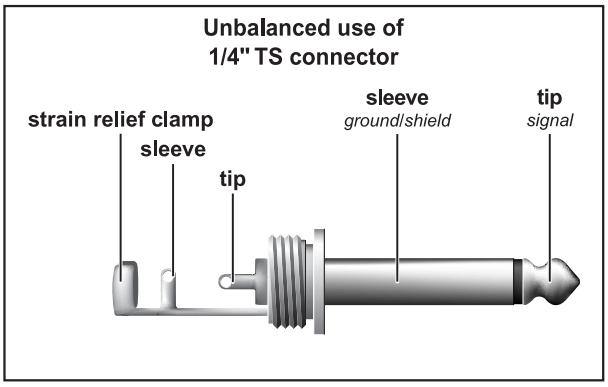

Fig. 8.2: 1/4" mono plug

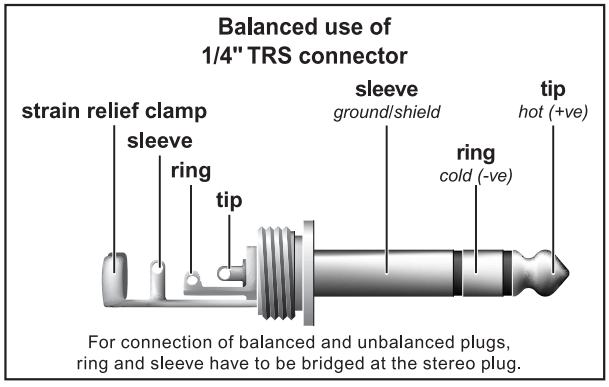

Fig. 8.3: 1/4" stereo plug

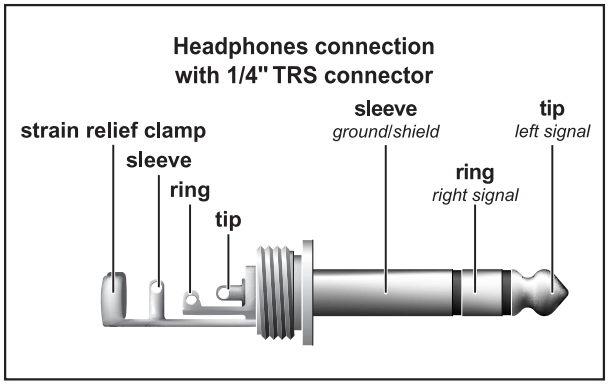

Fig. 8.4: Stereo headphones 1/4" plug

8.4 MIDI connections

The MIDI standard (**M**usical **I**nstruments **D**igital **I**nterface) was developed in the early '80s to enable different makes of electronic instruments to communicate with each other. Over the years the range of MIDI applications has constantly expanded, and today it is standard practice to network entire recording studios using the MIDI standard.

The heart of such a network is a computer with sequencer software that controls not only all the keyboards but also effects and other peripheral devices. In such a studio set-up you can control the V-AMP PRO in real time from a computer. For live performances in particular, you can also use a MIDI foot controller to control both effect parameters and preset changes on your V-AMP PRO.

The MIDI connectors on your V-AMP PRO are international-standard 5-pin DIN jacks. To connect your V-AMP PRO to other MIDI equipment you will need dedicated MIDI cables. They are commercially available in various standard lengths.

MIDI IN: receives MIDI controller data. The receiving channel can be adjusted in EDIT mode by pressing the A button and then using the arrow keys.

MIDI OUT/THRU: used for sending data to a computer or any other devices. You can transmit both preset data and parameter changes. If set to MIDI THRU, the V-AMP PRO does not send its own MIDI information, but passes on the signal received at the MIDI IN jack.

8.4.1 Sending/receiving MIDI-Sysex data

The V-AMP PRO can receive system-exclusive data from other MIDI devices provided that the MIDI function (button A) has been activated in EDIT mode. However, this means that all presets on the V-AMP PRO will be overwritten automatically. You can also transmit MIDI data from your V-AMP PRO to other devices (total dump) by switching to EDIT mode and pressing the MIDI button until the display reads "d". The total dump function can be useful for transferring all the stored data from your V-AMP PRO to a MIDI sequencer and storing it there.

To send individual presets to other devices: switch to EDIT mode by pressing both arrow keys on the transmitting unit simultaneously, activate the MIDI function and briefly tap the MIDI button. The preset data are first filed in the temporary buffer and can be stored in the preset position of your choice using the store function.

8.5 AES/EBU and S/PDIF standards

In principle, there are two standards for digital signal processing. AES/EBU is the professional, balanced connection via XLR connectors. This interface is based on two identical protocols published in November 1985 (EBU Tech. 3250-E) by the **E**uropean **B**roadcast **U**nion and in December 1985 by the **A**udio **E**ngineering **S**ociety (AES3-1985). Sony and Philips oriented themselves to this standard and developed a further interface with unbalanced signal routing and a few other major differences, predominantly related to the assignment of the channel status bits. This interface, named after the two companies and known as S/PDIF (Sony/Philips Digital Interface), uses either cinch jacks or optical connections with optical fiber cables. The procedure, standardized in IEC 958, made a name for itself mainly due to efforts to introduce a copy-protect technique. This standard also describes the revised AES/EBU interface, which was adapted to the S/PDIF format and named IEC 958 Type I (professional). The name of the S/PDIF interface is then IEC 958 Type II (consumer).

9. SPECIFICATIONS

AUDIO INPUTS

Guitar input	unbalanced 1/4" TRS connector
Input impedance	1 MΩ
Max. input level	+3 dBu
Pre DSP return/line in	unbalanced 1/4" TRS connector
Input impedance	45 kΩ
Max. input level	+9 dBu
Post DSP insert return L/R	unbalanced 1/4" TRS connectors
Input impedance	40 kΩ
Max. input level	+8 dBu

AUDIO OUTPUTS

Pre DSP send/line out	unbalanced 1/4" TRS connector
Output impedance	<1 kΩ
Max. output level	+9 dBu
Analog line outputs L/R	unbalanced 1/4" TRS connectors
Output impedance	approx. 680 Ω
Max. output level	+20 dBu
Analog DI out	balanced XLR connector
Output impedance	100 Ω
Nom. level (S1 - S3)	+4 dBu
Nom. level (L1 and L2)	-10 dBu
Post DSP insert send L/R	unbalanced 1/4" TRS connectors
Output impedance	1 kΩ
Max. output level	+8 dBu
Headphones connector	1/4" TRS stereo connector unbalanced
Max. output level	+15 dBu/100 Ω (+23 dBm)

DIGITAL OUTPUTS

Type	XLR (transformer-balanced)
Output impedance	110 Ω
Nominal output level	3.5 V peak to peak
Type	RCA (transformer-unbalanced)
Output impedance	75 Ω
Nominal output level	0.5 V peak to peak (not grounded, unbalanced)
Format	AES/EBU and S/PDIF, switchable
Sample frequency	44.1 / 48 / 96 kHz internal, 44.1 - 96 kHz wordclock, sample rate converter

WORDCLOCK INPUT

Type	BNC
Input impedance	50 kΩ
Nom. input level	2 - 6 V peak to peak

MIDI INTERFACE

Type	5-pole DIN jacks IN, OUT / THRU

SIGNAL PROCESSING

Converter	24-bit Delta-Sigma, 64/128 oversampling
Dynamics A/D	100 dB @ preamp bypass
Dynamics D/A	92 dB
Sampling rate	31.250 kHz
DSP	100 Mips
Delay time	max. 1,933 ms stereo
Runtime (line in -> line out)	approx. 5 ms

DISPLAY

Type	2-digit numeric LED

POWER SUPPLY

Mains voltage	U.S.A./Canada 120 V ~, 60 Hz U.K./Australia 240 V ~, 50 Hz Europe 230 V ~, 50 Hz
General export model	100 - 120 V ~, 200 - 240 V ~, 50 - 60 Hz
Power consumption	15 W
Fuse	100 - 120 V ~: **T 400 mA H** 200 - 240 V ~: **T 200 mA H**
Mains connection	Standard IEC receptacle

DIMENSIONS/WEIGHT

Dimensions (H x W x D)	approx. 3 1/2" (89 mm) x 19" (482.6 mm) x 5 1/4" (135 mm)
Weight	approx. 2.6 kg (5 3/4 lbs)

BEHRINGER constantly strives to maintain the highest quality standards. Modifications may be made, if necessary, without prior notice. The specifications and appearance of the equipment may therefore differ from those listed or illustrated.

10. MIDI IMPLEMENTATION

MIDI Implementation Chart			
Function	Transmitted	Received	Remarks
Midi Channel	1-16	1-16	-
Mode	N	N	-
Note Number	N	N	-
Velocity	N	N	-
After Touch	N	N	-
Pitch Bender	N	N	-
Control Change	-	-	-
1	N (request only)	Y	Wah Pedal
7	N (request only)	Y	Volume Pedal
12	Y	Y	Amp Gain (0-127)
13	Y	Y	Amp Treble (0-127)
14	Y	Y	Amp Mid (0-127)
15	Y	Y	Amp Bass (0-127)
16	Y	Y	Amp Vol (0-127)
17	Y	Y	Presence (0-127)
18	Y	Y	Reverb Mix (0-127) *2
19	Y (skipped on request)	Y	Amp Type (0-32) with default cabinet *3
20	Y (skipped on request)	Y	Fx Type (0-15) with defaults *1
21	Y	Y	Fx off/on (0/127)
22	Y	Y	Reverb Send off/on (0/127)
23	Y	Y	Cabinet Type (0-15) *5
24	Y	Y	Reverb Type (0-8) *4
25	Y	Y	Noise Gate Level (0-15)
26	Y	Y	Drive off/on (0/127)
27	Y	Y	Wah off/position (0/1-127)
44	N (request only)	Y	pre Effect Type (0-2) *6
45	Y	Y	pre Effect Par 1 *6
46	Y	Y	pre Effect Par 2 *6
47	N (request only)	Y	pre Effect Par 3 *6
48	N (request only)	Y	pre Effect Par 4 *6
49	N (request only)	Y	Delay Type (0-2) *7
50	Y	Y	Delay Time hi (0-117) *8
51	Y	Y	Delay Time lo (0-127) *8
52	N (request only)	Y	Delay Spread (0-127)
53	Y	Y	Delay Feedback (0-127)
54	Y	Y	Delay Mix (0-127) *9
55	N (request only)	Y	post Fx Mode (0-6) *10
56	Y	Y	post Fx Par 1 *10
57	Y	Y	post Fx Par 2 *10
58	Y	Y	post Fx Par 3 *10
59	Y	Y	post Fx Mix (0-127) *11
60	N (request only)	Y	Assign Effects Control (0-15) *1
61	N (request only)	Y	Amp Type (0-32) w/o cabinet change *3
64	N	Y	Tap (Value > 63)
80	N	Y	Request Controls (Value = 80)
81	N (request only)	Y	Set Pos (0-15), Set Character (32-127)
82	Y	Y	Tuner Bypass Volume (0-127)
83	Y	Y	Tuner Center Frequency (25-55)
84	Y	Y	Configuration (0-4=S1,S2,S3,L1,L2)
85	Y	Y	Live EQ Treble (0-127)
86	Y	Y	Live EQ Mid (0-127)
87	Y	Y	Live EQ Bass (0-127)
88	Y	Y	Digital out (44.1/48/96/ext; bit 2:pro)
Program Change	Y (0-124)	Y (0-124,127)	127=Tuner
System Exclusive	Y	Y	see SysEx Documentation
System Common	N	N	-
System Real Time	N	N	-
Running Status	Y (2s Timeout)	Y	-

Tab. 10.1: MIDI Implementation

11. WARRANTY

§ 1 WARRANTY CARD/ONLINE REGISTRATION

To be protected by the extended warranty, the buyer must complete and return the enclosed warranty card within 14 days of the date of purchase to BEHRINGER Spezielle Studiotechnik GmbH, in accordance with the conditions stipulated in § 3. Failure to return the card in due time (date as per postmark) will void any extended warranty claims. Based on the conditions herein, the buyer may also choose to use the online registration option via the Internet (www.behringer.com or www.behringer.de).

§ 2 WARRANTY

1. BEHRINGER (BEHRINGER Spezielle Studiotechnik GmbH including all BEHRINGER subsidiaries listed on the enclosed page, except BEHRINGER Japan) warrants the mechanical and electronic components of this product to be free of defects in material and workmanship for a period of one (1) year* from the original date of purchase, in accordance with the warranty regulations described below. If the product shows any defects within the specified warranty period that are not excluded from this warranty as described under § 3 and 4, BEHRINGER shall, at its discretion, either replace or repair the product using suitable new or reconditioned parts. In the case that other parts are used which constitute an improvement, BEHRINGER may, at its discretion, charge the customer for the additional cost of these parts.

2. If the warranty claim proves to be justified, the product will be returned to the user freight prepaid.

3. Warranty claims other than those indicated above are expressly excluded.

§ 3 RETURN AUTHORIZATION NUMBER

1. To obtain warranty service, the buyer (or his authorized dealer) must call BEHRINGER (see enclosed list) during normal business hours **BEFORE** returning the product. All inquiries must be accompanied by a description of the problem. BEHRINGER will then issue a return authorization number.

2. Subsequently, the product must be returned in its original shipping carton, together with the return authorization number to the address indicated by BEHRINGER.

3. Shipments without freight prepaid will not be accepted.

§ 4 WARRANTY REGULATIONS

1. Warranty services will be furnished only if the product is accompanied by a copy of the original retail dealer's invoice. Any product deemed eligible for repair or replacement by BEHRINGER under the terms of this warranty will be repaired or replaced within 30 days of receipt of the product at BEHRINGER.

2. If the product needs to be modified or adapted in order to comply with applicable technical or safety standards on a national or local level, in any country which is not the country for which the product was originally developed and manufactured, this modification/adaptation shall not be considered a defect in materials or workmanship. The warranty does not cover any such modification/adaptation, irrespective of whether it was carried out properly or not. Under the terms of this warranty, BEHRINGER shall not be held responsible for any cost resulting from such a modification/adaptation.

3. Free inspections and maintenance/repair work are expressly excluded from this warranty, in particular, if caused by improper handling of the product by the user. This also applies to defects caused by normal wear and tear, in particular, of faders, potentiometers, keys/buttons and similar parts.

4. Damages/defects caused by the following conditions are not covered by this warranty:

- ▲ improper handling, neglect or failure to operate the unit in compliance with the instructions given in BEHRINGER user or service manuals.
- ▲ connection or operation of the unit in any way that does not comply with the technical or safety regulations applicable in the country where the product is used.
- ▲ damages/defects caused by force majeure or any other condition that is beyond the control of BEHRINGER.

5. Any repair or opening of the unit carried out by unauthorized personnel (user included) will void the warranty.

6. If an inspection of the product by BEHRINGER shows that the defect in question is not covered by the warranty, the inspection costs are payable by the customer.

7. Products which do not meet the terms of this warranty will be repaired exclusively at the buyer's expense. BEHRINGER will inform the buyer of any such circumstance. If the buyer fails to submit a written repair order within 6 weeks after notification, BEHRINGER will return the unit C.O.D. with a separate invoice for freight and packing. Such costs will also be invoiced separately when the buyer has sent in a written repair order.

§ 5 WARRANTY TRANSFERABILITY

This warranty is extended exclusively to the original buyer (customer of retail dealer) and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, etc.) shall be entitled to give any warranty promise on behalf of BEHRINGER.

§ 6 CLAIM FOR DAMAGES

Failure of BEHRINGER to provide proper warranty service shall not entitle the buyer to claim (consequential) damages. In no event shall the liability of BEHRINGER exceed the invoiced value of the product.

§ 7 OTHER WARRANTY RIGHTS AND NATIONAL LAW

1. This warranty does not exclude or limit the buyer's statutory rights provided by national law, in particular, any such rights against the seller that arise from a legally effective purchase contract.

2. The warranty regulations mentioned herein are applicable unless they constitute an infringement of national warranty law.

* Customers in the European Union please contact BEHRINGER Germany Support for further details.

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